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As the scope of the *Année* is purely biological, psychologists have certainly no ground to complain of the treatment which their science receives: the entire section is conceived in a spirit entirely friendly to its claims as a distinct science, and is written for the most part by persons who rank high in the department. If any criticism were to be offered, it would be that it is not perfectly clear why certain departments of psychology that are not mentioned do not deserve treatment in this connection fully as much as certain others that are admitted. But to suggest this would be to look a fine gift horse in the mouth, and we can do no better than express our delight at the whole-hearted recognition which the older science has here accorded to the newer. It is to be hoped that the plans of the *Année biologique* will not be altered in this respect, and that in future the psychologist may always be able to trace the progress of research on the biological side of his department by simple reference to the pages of this annual.—H. C. W.

ANTHROPOLOGY.¹

The Tomahawk of the North American Indian.—In regard to your inquiries concerning tomahawks in the United States National Museum I would say that, in order to understand their structure, their function and the places which they supplied in the armory of the Indians of the United States it is best to remember the following facts: Aborigines of this Continent seem to have understood all the ways of killing men and animals. Before the discovery they used both poison and fire to take life, and they had the three great types of weapons, namely: for bruising, for piercing and for cutting. Adrien de Mortillet somewhere calls attention to the additional fact that each one of these classes of weapons, to-wit: bruising, piercing and cutting, is used in the hand, at the end of a handle, or thrown from the hand. You will see that underlying this division of Mortillet's we have three methods of applying force. First, directly utilizing the explosive force of human muscle. Secondly, the additional impetus given to a weighty weapon by affording it a longer excursion in the air and the added element of safety in that by means of a long handled bruiser, piercer or cutter the attacking one produces his effect at a greater distance from himself. The ballistic weapon, seldom thrown from the hand alone, acquires its velocity and additional force by means of a sling, throwing stick or a bow.

¹ This department is edited by H. C. Mercer, University of Pennsylvania.

With this analysis in hand let us return to the tomahawk ; it is a compound weapon, having for its function both bruising and cutting. It is also a handled weapon. The addition of the pike to the poll of the tomahawk is simply one of those delightful transitions which all industrial things undergo in passing from the useful into the ceremonial and mythic condition. In the aboriginal times tomahawks had no pike attachment.

The iron tomahawks in the United States National Museum are of two distinct classes : the one has an edge like a carpenter's hatchet, the other has a point and so belongs rather to the striking-piercing than to the striking-cutting apparatus of the northern type. So far as the record of these instruments go, the broad-edged, hatchet-like tomahawks were first sold to the Indians by the English and Dutch, while those with the pointed blade came through the Spaniards and the French or through southern or Latin Europeans. Indeed, the blade of this tomahawk is that of a pike and is bent at right angles so as to work with a blow rather than with a thrust.

Now, according to universal usage of savage peoples, they usually accept from civilized traders those things which supply a "long felt want." This "long felt want" is usually, both in practical life and in scientific pursuits, the consciousness of a mechanical incapacity or weakness. Very frequently the artisan knows what he wants, but he has not the practical skill to invent it. The savages of this country, then, exploited the tomahawk and took it in lieu of something they were using, but which was far inferior to their desires in this direction. For their bloody work the hatchet-tomahawk or the pike-tomahawk was a boon.

The weapons of this class which preceded the metallic ones were made of antler, in which the long prong furnished the handle and the shorter prong the working portion with or without the addition of a sharper point. In countries where the elk-horns of heavy antlers were not procurable, and good working hatchet blades of volcanic stone could be procured, the tomahawk was simply a celt or grooved blade set into a handle by one of the many ways by which hafting was formerly done.

In considering, therefore, the great mass of so-called celts and grooved axes, it must be understood that while a portion of them were industrial tools with the savage artisan, many of them were a striking-cutting weapon attached to a handle to enable the warrior to do his work at a short distance.

A most efficient form of the striking-cutting weapon was the Mexican battle-axe, consisting of a handle of wood along the edges of which spalls of obsidian and rugged stone were set. In some instances these chipped blades were placed so close together and in such regular fashion as to suggest the first steps in the invention of the sabre which is a striking-cutting weapon.

Some of the Siouan tribes of the Missouri River, in later days, inserted heavy spikes or blades of butcher's knives and other blood-curdling objects, doing their work precisely after the fashion of the Mexican axe.

In the Antillian area and over nearly all of South America north of the parallel of Rio Janeiro, the blades of the tomahawks and battle-axes were exquisitely fashioned and polished.—OTIS T. MASON.

A Triple Indian Grave in Western New York.—On September 10, 1885, I opened an Indian grave which was of interest in many ways. In the first place, it was located near the site of Ganagarū, which was, for many years, the principal village of the Seneca nation, and for which they seem to have had an unusual degree of pride and affection. This village was destroyed at the approach of De Nonville's invading troops in 1687, and was never rebuilt, perhaps from sentimental motives. This village site occupies an area of at least ten acres, and is still marked by burnt soil, chips of chert—brought from a distance—fragments of pottery and of clay pipe-stems and even more perfect relics. During the early days of the American village of Victor, the settlers depended for old iron largely upon the lost tomahawks of the Indians, and quantities of French glass and wampun beads, of chert and brass arrow-heads and of many other relics, attest the richness of this Indian capital.

During the spring of 1885, Mr. George Ketchum, residing near Victor, plowed out a brass kettle and a few bones from the brink of a slight fall of land. It is at such places as this that the plow is most likely to detect ancient interments, the earth being gradually carried down hill so that after the lapse of years, the original grade has been so changed that the plow hooks into a skull, throws up a long bone, or tears out some article deposited with the skeleton.

At my visit, it was comparatively easy to expose the remaining contents of the grave. The bones of the skeletons were not all present, suggesting either that they had been disturbed by burrowing animals or that the interment had been made after prolonged exposure on an aerial scaffold as was practiced almost uniformly by many tribes, and,

to some extent, by the Iroquois. In burials after exposure on scaffolds, however, a dozen or twenty bodies were usually collected and interred almost without relics and in a very limited area. Other burying places were noted in the same field, but at much greater distances than usual.

While it was impossible to ascertain the exact attitude in which the bodies were laid, all of the heads pointed toward the west, and the mummy position, so frequently noted in graves of the Iroquois, was not apparent. Of the three skeletons, one was conspicuous for its development, though not for its height. The femurs showed a "third trochanter" almost as plainly as do those of the horse, while, in most human skeletons, this projection has become merely a roughening of the bone. The skull showed the lines of muscular attachment as I have never seen on another, and, in general, it was evident that this warrior must have been a person of tremendous physical development. The comparatively open sutures of the skull showed that he was still below middle age, though fully matured. The second skeleton was that of an adult of moderate build and apparently older than the first. The third skeleton, which was very incomplete, was that of a small child. The molars, which are usually cut in the sixth year, were not quite out of the bone of the jaws.

At the neck of the first skeleton, so as to discolor the upper part of the breast bone and the first ribs, was a string of brass beads. These had oxidized, and the verdegriis had preserved the leathern string on which they were worn, so that the loose single bow-knot, tied many years ago, has remained intact. A number of red stone beads had fallen away from the neck and lay at the level of the bottom of the grave. These were square on section, of about an inch in length, and some were nicked or rudely ornamented. They appeared to be made of the western pipe-clay; at any rate, they were of material not found for many miles about the site of the grave. A pipe-stem, of the clay of the vicinity, was found near this skeleton, and at the feet was a brass kettle. At the feet of the second skeleton was another kettle and part of an iron knife, rusted almost to disintegration. With the child's skeleton was found a brass sleigh-bell. Besides these relics must be counted the kettle plowed out of the grave in the spring.

Within the kettle found near the feet of the second skeleton was a mass of vegetable fibre resembling moss. A similar mass found in a kettle buried with a skeleton at the village site mentioned, showed a right-angled crossing of some bands of fibres, and strongly suggested that the decayed vegetable tissue had been a basket or some similar plaited receptacle.

It is possible to compute the age of this interment within somewhat wide limits. Articles of European manufacture had not become common among the Senecas of this region till within quite a short time of De Nonville's expedition. On the other hand, the history of Victor goes back about a hundred years, so that it is practically certain that this grave is not earlier than 1650 nor later than 1800. So far as could be judged by the appearance of the bones—by comparison with others in which some idea of the age of interment may be formed—and by the state of preservation of the relics, the remains date back of English influence and come within the period of French influence, somewhere about the close of the seventeenth century.

The grave referred to as opened at the site of the village of Ganagarū, was described in the *NATURALIST* several years ago. The skeleton was that of a young person, the wisdom-teeth not having been fully developed and the bones being immature, though nearly of adult size. The body had been put or had been left in the "mummy attitude," with elbows and knees bent at the sides of the trunk. Strangely enough, the remains were found head downward. With this skeleton rested that of a turtle—perhaps indicating the clan of the deceased—thirty feet of French glass beads, ninety feet of wampum, a brass kettle, a bone head-comb, showing in silhouette, the figures of a man on horseback and of another person standing behind him, and other ornaments. These would seem to indicate that the person was a woman, and doubtless a young lady of distinction, from the wealth buried with her.

Other burials in the same vicinity have shown somewhat similar relics, and belong to the period when the wares of the French traders were mingled with the weapons and implements of the Stone Age.

A. L. BENEDICT.

SCIENTIFIC NEWS.

Mr. J. E. S. Moore has an interesting sketch of some of the faunal features of Lake Tanganyika in *Nature* of July 1. He concludes "that the fauna of Tanganyika is comparatively old, for it is unlike anything now inhabiting the sea, and if it is derived from a previous freshwater stock, much time would be required for the evolution of its widely divergent present forms."

The natural history building of the University of Illinois, dedicated a few years ago, was struck by lightning on June 17 and partially de-